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MEDICAL RESEARCH LABORATORY

U. S. Naval Submarine Base
New London

Vol. XII, No. 1 Report No. 216 12 Jan. 1953

THE INTERVIEW:

IV. The Reliability and Validity of the Assessment Interview as a Screening and Selection Technique in the Submarine Service

by

Siroon Pashalian
and
William J. E. Crissy

Bureau of Medicine and Surgery, Navy Department
Project NM 002 016.01.04

Report No. 4 on
a collaborative project between
Fordham University and the Naval Medical Research Laboratory
under Office of Naval Research Contract,
Project N-onr 259 (00)

Reference may be made to this report as follows: Pashalian, S., and Crissy, Wm. J.E., The Interview: IV. The Reliability and Validity of the Assessment Interview as a Screening and Selection Technique in the Submarine Service, MRL Report No. 216, XII, No. 1, January 1953.

THE INTERVIEW

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Siroon Pashalian, M.A., and Wm.J.E.Crissy, PhD.,

Fordham University

Medical Research Laboratory Report No. 216

Bureau of Medicine and Surgery, Navy Department
Project NM 002 016.01.04

Released by

Gerald J. Duffner
Commander, MC, U.S.Navy
Officer-in-Charge
U.S.Naval Medical Research Laboratory
15 January 1953

THIS REPORT CONCERNS .

An investigation of the reliability and validity of the assessment interview in the screening and selection of enlisted personnel for the submarine service.

IT IS FOR THE USE OF . . . .

Submarine medical officers, personnel officers, and psychologists who are concerned with the interview and other related selection problems.

THE APPLICATION FOR SUBMARINE MEDICINE . . . .

Will be in the revison of assessment procedures, the training of prospective medical officer interviewers, the guidance of those responsible for assessment and as a source of ideas for further research in this area.

Issued by the Naval Medical Research Laboratory

For Official Use

ABSTRACT

This report is the last of four reports in connection with research on the problem: "The reliability and validity of the assessment interview as a screening and selection technique in the submarine service".

One hundred and nine interviews were recorded and analyzed for content, speaking time patterns and both intra-rater and inter-rater reliability. Six hundred and eighty-two interview decisions were analyzed for validity against an immediate criterion of pass-fail in the Basic Submarine School, at the Submarine Base, New London, Connecticut.

Content analysis revealed high consistencies for items pertaining to interest in submariners and factual type personal history items. However, the latter are judged to be of questionable assessment value in the light of the low consistencies in the coverage of related attitudinal type items. Time analysis revealed the need for letting the interviewee do more of the talking. Both intra-rater and inter-rater reliability are high, but considerable variation is indicated in the standards and reporting of compiled individual traits. Validity of the assessment interview is high for the overall decision of acceptance or rejection for Basic Submarine School, but this is partially an artifact of an unusually high selection ratio.

TABLE OF CONTENTS

ACKNOWLEDGMENTS

Many persons whose names are not in the by-lines of the four reports contributed to the progress of the project. It is to commit their names to the record, to acknowledge their assistance, as well as to focus upon the very interdependent nature of their roles in the research team, that this note is prefaced to the final report of this collaborative research undertaking.

First, none of the present or past staff of the U.S.Naval Medical Research Laboratory appears as an author on any of the reports. Yet, the Laboratory staff as a group did a large share of the work. Indeed, their contributions ranged from basic data production to final editing of copy and production of the reports.

Specifically, though not inclusively, the following contributions by Naval personnel are cited. The present Officer-in-Charge, Commander Gerald J. Duffner, MC, USN, and the former Officer-in-Charge, Captain Thomas L. Willmon, MC, USN, made themselves available for consultation and planning throughout the project. Commander Duffner contributed much to the structuring of the interview form and has been a most helpful editor.

The following medical officers participated as interviewers and/or re-evaluators of soundscripts: LT D. P. Bernard, LT Wm.W. Byrnes, LT T. Camp, LT R. F. Dykhuizen, LT J. H. Ebersole, LCDR F. T. Johnson, CDR J. L. Kinsey, LT J. J. Lawson, LT D. A. Peterson, LT E. C. Stone, and LT J. H. Schulte. Commander Kinsey was able to guide the steps of the investigation on many occasions, in addition to serving as interviewer, and drew upon his broad background in psychiatry. LT Ebersole and LT Lawson contributed many liberty hours to re-evaluation of interview soundscripts.

LT JG D. L. Briggs, MSC, USNR, M. T. Smith, PNC, USN, and A.S. Przekop, PNC, USN, (chief personnelmen), O. E. Boston, HM3,USNR, M.F.Kauffman, PN3, USN, and Dean I. Stiles, PN3, USNR, petty officers attached to the Laboratory, all did much to insure that basic data were collected and that much of the derived statistical work was carried through to completion.

Mrs. Ann Evans put in more man hours on the IBM equipment than anyone can calculate and her cheerful industriousness warrants special mention. Mrs. Marion Elliott and Mrs. Florence McGauley did a large share of the machine calculations and coding. Mrs. Jessie W. Kohl, technical editor of the Laboratory's Publication Branch, and her assistant, Mrs. Zelda Smith, carried the reports from manuscript stage to final publication and distribution.

Second, at Fordham University, there were many people who should be mentioned for their assistance in seeing the project through to completion. Four consultants, Dr. Jeanne Gilbert, Dr. Milton W. Horowitz, Dr. Joseph Kubis, and Dr. Richard T. Zegers, met with the investigators when requested and made many suggestions which were later incorporated in the study.

In addition to the investigators mentioned in the by-lines, the following graduate assistants did various jobs as required: Bertram Friedman, William T. Gallagher, and Joseph Ruocco. The following undergraduate assistants were used in various clerical capacities: Catherine Colubriale, Melvin Goetz, and Howard Leventhal.

Mrs. Ruth Maciag, secretary in the Psychology Department at Fordham University, did numerous typing jobs. Special mention should be made of the clerical versatility and general contribution to esprit of Mrs. Anne McCabe, who worked as clerical assistant and also typed the manuscripts, not simply once, but many times.

Whatever beneficial effects may be derived from the project are attributable in large measure to these people and to the senior collaborators, Siroon Pashalian, Associate Project Director, Edward Buckley, Frank McCabe and Arthur I. Siegel. Shortcomings, appropriate-enough, fall on the shoulders of the project director.

WM. J. E. CRISSY

THE INTERVIEW
IV. THE RELIABILITY AND VALIDITY OF THE ASSESSMENT INTERVIEW AS A SCREENING AND SELECTION TECHNIQUE IN THE SUBMARINE SERVICE

INTRODUCTION

The problem of screening and selecting submariners has long been a concern to the Navy. Continual development and appraisal of screening and selection techniques are made at the U.S.Naval Medical Research Laboratory, New London, Connecticut. However, because of a lack of sufficient specialized personnel at the Laboratory, relatively little attention had been given to the evaluation and improvement of the assessment interview since World War II. Consequently, a program for the reactivation of research on the assessment interview was undertaken in March 1951 as a collaborative effort of the U.S.Naval Medical Research Laboratory and a group of investigators at Fordham University.

Before focussing on a study of the assessment interview as conducted at the Laboratory, it is important to set it in its proper place and background in the entire screening and selection procedure. Candidates for submarine service, a group comprised typically of volunteer recruits and of volunteer and recommended surface ship men, must submit to various test hurdles as sketched in Figure 1, (page 2) before they qualify as submariners. It should be pointed out that, whereas all candidates undergo examination at the stages up to and including the interview, only those who are accepted on the basis of the interview, go on to Basic Submarine School. Then only those who pass Basic Submarine School may go on to Advanced Submarine School, if assigned, or aboard the submarines. Finally, only those who qualify after a period aboard the submarines are accorded the submariner status.

The assessment interview, therefore, represents the point at which:

(1) All previously gathered data on the candidate are scrutinized

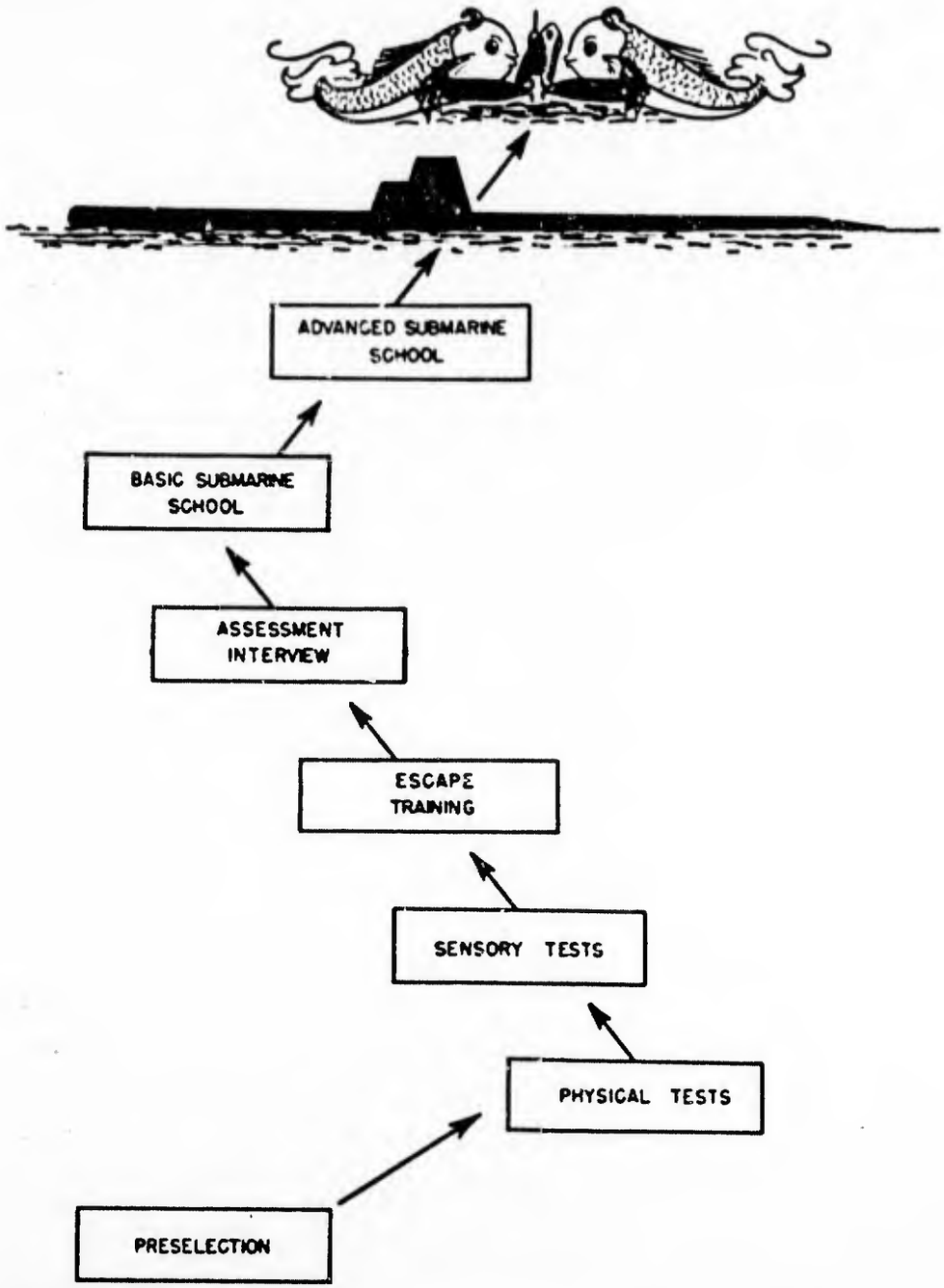

Figure 1. - Hurdles in the screening and selection of candidates for the submarine service.

by Medical Officer interviewers for their agreement with the standards of acceptance in each preceding area of examination; (2) Judgment is made by Medical Officer interviewers of personal and social adjustment as well as motivation for submarine service; (3) An overall decision is made by the Medical Officer interviewers regarding the fitness of each candidate to advance to Basic Submarine School. The interview report form which had been in use at the Medical Research Laboratory upon the activation of the present investigation is exhibited as Appendix A.

It can be noted that (2) above represents that function of the interview which is most independent of the factors examined at other hurdles. In other words, the assessment interview provides the relatively unique opportunity to view, probe and judge the candidate with regard to personal and social adjustment traits and to evaluate his interest, aptitude and motivation for submarine service.

PURPOSE

Indications from previous studies at the Medical Research Laboratory have pointed to the fact that men who fail to qualify for the submarine service are not dismissed as much for inadequacies in aptitude and achievement as for inadequacies in personal and social adjustment. The problem, then, of evaluating the effectiveness of the assessment interview is essentially one of accepting or rejecting the following basic hypotheses:

Hypothesis 1. Prospective submariners have personal and social adjustment traits which are differentiable within the group.

Hypothesis 2. Differences in personal and social adjustment traits exist between those likely to succeed and those likely to fail in the submarine service.

Hypothesis 3. These personal and social adjustment traits are observable and ratable in the assessment interview situation.

In order to test these hypotheses, the projected research was aimed at solving the following specific problems:

A. Background Survey of the Literature

What are the findings, civilian and military, on the interview as a screening and selection technique?

B. Reliability

1. How consistent is the interview content?
2. How consistent is the pattern of interviewee and interviewer speaking time?
3. How consistent are each interviewer's judgments?
4. How consistent are each interviewer's judgments with those of other interviewers?
5. How reliable are the instruments which are in use as aids to the interviewer?

C. Validity

1. How well does the interview predict success in the submarine school?
2. * How well does the interview differentiate the disqualified from those who qualify on board submarines?
3. * How well does the interview relate to other predictors?
4. How valid are the instruments which are in use as aids to the interviewer?

D. Isolation of relevant traits

1. What are the traits relevant to success in submarines?
2. What evidence exemplifies the presence and quantity of each trait?

Clearly, these are the continuing problems which are inherent in an evaluation of interview procedures. As a result, answers to these questions which may be definitive for a given period of time must periodically be re-examined and re-appraised, and procedures must be revised in the light of the findings. It was anticipated, therefore, that,

* It was not possible to explore these questions during the period of the present investigation due to the unavailability of criterion data from the submarines.

although the present investigation may not be able to provide full replies to all these questions for the period under study, it would spell out the pattern for the conduct of continuing research by the Medical Research Laboratory.

PROCEDURE

For each question posed in the preceding section, and paralleling the organization and numbering sequence there, an account of the appropriate research designs which were adopted is given in this section.

A. Background Survey of the Literature

A systematic and comprehensive survey of the civilian and military literature on the interview and on aspects of the submarine frame of reference was undertaken. Materials were reviewed through April 1952. One hundred fifty-six titles, read and deemed most pertinent to the present investigation, were abstracted; twenty-seven titles which were read and considered of possible interest in kindred research, were listed. These abstracts and titles were incorporated into a separate initial report entitled, "The Interview: I. A Selectively Abstracted Bibliography." Three indexes facilitating entry to the titles by author, by subject and by journal were appended.

B. Reliability

To determine the consistency of interview content, and of interview speaking time patterns, and the intra-and inter-rater reliability of the judgments made in the interview, the research design involved the collection of soundscripts. Interviews by Medical Officer interviewers with candidates for the submarine service at the Medical Research Laboratory were recorded during the period 15 March 1951 to 15 July 1951. Special instructions to the recorder calling for strict random selection of interviews to be recorded proved to be unfeasible due to such difficulties as "turnover in interviewers," periodicity of the interview schedules, and equipment limitations in that the recording circuit comprised several microphones wired to a single tape recorder.

Instead, interviews were recorded at the discretion and judgment of the recorder who made use of such considerations as daily and weekly interview loads, the number of interviews currently gathered for each interviewer, and the like.

Interviewers and interviewees did not realize that recordings were being taken at a particular time. However, the Medical Officer interviewers had been briefed concerning the study and its general methodology. They admitted to some conscious awareness of the possibility of being tuned in on only in the early weeks. Of course, it is difficult to estimate the influence of the interviewers' knowledge of the study in progress on the plan to obtain a fair sampling of the assessment interview as it was being conducted at the Medical Research Laboratory upon activation of the present research. While it is viewed as a factor which would tend to improve the pattern of conducting the interview progressively by the direction of more conscious effort and attention, its exact influence remains unevaluated.

As far as the method of collecting the soundscripts is concerned, then, no serious biasing factor could be foreseen. By 15 July 1951, one hundred nine interviews had been recorded in an audible manner and these interviews involved six interviewers. This recorded sample constitutes the one on which the present procedures and findings on reliability are based.

To check on the representativeness of this sample, which inferentially would yield a check on the representativeness of the findings, data were gathered on selected variables for the total "population" processed during the period 15 March 1951 to 15 July 1951. The characteristics of the total "population" on these selected variables were then compared with the characteristics of the recorded sample and also with those of the remainder, or unrecorded, sample.

The first variable requiring this check was that of interviewers: Were the interviewers in the soundscript sample represented in the

same proportions there as they were in the interviewing of the total "population" of submarine candidates? The frequency and percentage of interview load for each interviewer are set forth in Table 1 below for each of the three interviewed groups.

Table 1.- Frequency and percentage of interview load reflected for six interviewers* in the total "population", recorded and unrecorded interviewed groups during the period 15 March 1951 to 15 July 1951

Interviewer	Interviewed "Population"		Interviewed-Recorded		Interviewed-Unrecorded	
Code	N_p	% of N_p	N_r	% of N_r	N_u	% of N_u
A	208	36	43	39	165	35
B	129	22	21	19	108	23
C	108	19	20	18	88	19
D	72	12	15	14	57	12
E	44	8	6	6	38	8
F	19	3	5	5	14	3
Totals	580		109		470	

* At least three other interviewers were involved in the "population" interviewed. Due to wiring difficulties the soundscripts collected on these interviewers, however, were inaudible, and eliminated from the study. Figures here, therefore are based on totals involving the six interviewers from whom audible soundscripts were obtained. They are unrepresentative to the extent that they are not based on an additional 102 interviews in the "population" group by at least 3 interviewers who did from 8 to 53 interviews during the period under study. Inclusion of these cases, however, would not alter the general interpretation of the representativeness of the principal interviewers involved in the study in relation to one another.

The data in Table 1 show, in each case, the representation of the number of interviews for each interviewer in the recorded sample compares very favorably with the general interview load each of these interviewers shared in the total "population". Notably, each inter-

viewer falls into the same rank position in interview load, and there are no more than three percentage points of discrepancy in the exact percentages of the load.

Two other variables regarding naval status and the related factor of age were also examined: (1) Were the interviewees in the recorded sample distributed in the same proportion by the branches of the Navy, by pay grade and by age as they were in the total "population"? The frequencies and percentages of the cases for each of the three interviewed groups in each branch of the Navy, in each pay grade and in given age groups are presented in Table 2, below:

Table 2.- Frequency and per cent of cases distributed by branch of the Navy, pay grade and age in the total "population", recorded and unrecorded groups during the period 15 March 1951 to 15 July 1951

	Interviewed "Population"		Interviewed Recorded		Interviewed Unrecorded	
Branch of Navy	N_p	% of N_p	N_r	% of N_r	N_u	% of N_u
U.S.N.	646	95	93	85	553	96
U.S.N.R.	16	2	8	7	8	1
Unidentified	20	3	8	7	12	2
Totals	682		109		573	
Pay Grade						
SA, FA, TA	397	58	56	51	341	60
SN, FN, TN	125	18	23	21	102	18
PO3	72	11	17	16	55	10
PO2	27	4	3	3	24	4
PO1	21	3	2	2	19	3
CPO	10	1	-	-	10	2
Unidentified	30	4	8	7	22	4
Totals	682		109		573	
Age						
16-20	423	62	64	59	359	63
21-25	188	28	33	30	155	27
26-29	39	6	4	4	35	6
31-35	4	1	0	-	4	1
Unidentified	28	5	8	7	20	3
Totals	682		109		573	

Here again, it can be seen that the representation of candidates in the recorded sample by branch of the Navy, by pay grade and by age aligns itself very favorably with these characteristics of the total "population". There are no more than ten percentage points discrepancy for these three variables. This discrepancy is in the case of the branch of Navy, and shows a somewhat lesser representation of regular Navy personnel in the soundscript sample than in the "population" group. Finally, these groups were compared for performance in various psychometric measures. The means and standard deviations on the measures for the total "population", recorded and unrecorded samples are given in Table 3, below:

Table 3.- Means and standard deviations* of GCT, Arithmetic and Mechanical test scores for the total "population", recorded and unrecorded groups during the period 15 March 1951 to 15 July 1951

Test		Interviewed "Population"	Interviewed-Recorded	Interviewed Unrecorded
GCT	Mean	60.51	61.16	60.35
	S.D.	6.60	6.50	7.17
	N	664	101	563
Arithmetic	Mean	57.98	58.84	57.98
	S.D.	6.68	6.68	6.68
	N	664	101	563
Mechanical	Mean	55.45	55.92	55.37
	S.D.	7.74	7.29	7.81
	N	658	101	558

*Based on the available data, making the assumption that scores for the cases on whom data were missing would not have changed the interpretation.

From the data in Table 3 it is apparent that the members of the recorded sample distributed themselves on these aptitudinal-type measures in much the same way as did the total "population".

On the basis of these checks for selected variables, it can be inferred, the recorded sample constituted a fair sampling of the total population of submarine candidates processed during the period.

1. Content Analysis

The interview soundscripts were audited and studied for content. A list of verbal items and incidents occurring throughout the set of interviews was compiled. In particular, the kinds of questions asked by the interviewers were noted. These were subsequently arranged under summary headings for convenience in the process of referral and analysis. For example, the interviewer may have asked the candidate how long he had been in the service and why he wanted submarines; items which seemed to be concerned with naval experience were grouped and subsumed under the heading "Naval Experience". As the body of items were gathered it became evident that the virtually unstructured nature of the interviews, and the specificity of personal histories would lead to an unwieldy analysis. Clearly, no single system of substantive categories could be devised to describe the content of the interviews. Patently, the purpose of the content analyst will govern the particular scheme adopted of the many which might be devised. Several considerations, therefore, suggested themselves as criteria governing the inclusion, definition, and structure of the units in the analysis which would be in line with the primary purpose of determining the degree of consistency of interview content from interview to interview, and from interviewer to interviewer. These criteria may be summarized as follows:

(1) Generally Applicable: The item or incident could conceivably have occurred in all interviews;

(2) Mutually Exclusive: The presence of one item or incident should not depend on the presence of any other item;

(3) Optimally Fine: The "size" of the unit should be of such detail as to render a meaningful comparison among interviews and interviewers by pointing up apparent differences in the coverage of interview content, without obscuring apparent consistencies.

(4) Reliability: The unit should be precisely, yet broadly, defined (as the meaning of the unit refers to the many ways of eliciting it in different interviews), so as to permit high reliability between coders, i.e., consistency of the analysis itself.

(5) Comprehensiveness: The quantity of items should be of sufficient number to render as complete and meaningful an analysis as possible.

(6) Parallelism: The item should be so "loosely" defined as to permit systematic comparison between interviews. For example, the item mother's attitude toward submarine service should be extended to include that of a female figure who reared the interviewee and therefore, may be considered a "parallel" or substitute for a mother, to allow for all the shades of possibilities in personal histories.

(7) Ease: At the same time, the formulation of the body of items should admit of ease and feasibility in carrying out the analysis during a single playback.

Thus, the items on the instrument for content analyzing the soundscripts were formulated from those which were observed to occur, as opposed to a preconceived system. The instrument was then pre-tested on a batch of recordings from which the items had not been derived to check its stability, generality and comprehensiveness. The pre-test clearly revealed the necessity of viewing the categories not simply as questions asked by the interviewer of the interviewee, but as subject matter elicited in the interview, by interviewer and/or by interviewee. That is, although the unit may have been derived originally from a question of the interviewer, e.g., "What do you want to strike for on the submarines?", this content may have been elicited spontaneously, without

the direct inquiry, in response to another question, viz, the reason for his interest in submarines. From the standpoint of the objective in this content analysis, spontaneously offered content was considered as valid a coverage of content as a directly-elicited reference, and scored in the appropriate category. The pre-test showed sufficient stability in coverage and applicability of the items in the content analysis to render adequate the basic structure of the instrument, with some additions and revisions. The system was then set aside for a period and reviewed with increased perspective. Further refinements in line with the same criteria were suggested.

Finally, the scheme for the content analysis was applied to each of the 109 recordings. Frequency counts on the extent to which the analytic categories appeared in the content of the interview were converted to percentages of the total sample and the frequencies for a given interviewer were converted to percentages of his sample.

2. Time Analysis

Originally, the process of measuring the various speaking time expenditures during the interview was governed by the following three considerations:

(1) The thought that certain personality characteristics are reflected in the amount of talking done in such inter-personal situations. For example, it might be supposed that the more dominant person might do proportionally more talking than the interviewer, other things being equal.

(2) These data might be an indication of interviewer performance. For example, writers on interviewing make such statements as "The good interviewer lets the interviewee do the talking".

(3) These data might facilitate the training of interviewers by establishing, perhaps, an optimal time expenditure during the interview

These considerations notwithstanding, it soon became apparent

that time expenditure was also a facet of the problem of reliability. That is, how consistent were the speaking patterns of interviewer and interviewee, and also how consistently was sufficient total time alloted in the interviews?

Cumulative stop watches were employed to measure the time spent in speaking by the interviewer, by the interviewee and the time expended without either speaking (designated hereafter as "dead" time), and the total interviewing time for each interviewer. All measures of time were based arbitrarily from the interviewer's introduction of himself, a formality which was instituted during the study for the purpose of identifying the recordings. These data were analyzed for each interviewer and for the set of soundscripts as a whole.

Reliability of these data was found by correlating the obtained measures with a re-take for every fifth case.

3. and 4. Intra-rater and Inter-rater Consistency

When the project was activated, interview reports or ratings of the interviewees were being made solely in the designated space of the concise interview report form, on which the data on the candidate from all previous examinations were summarized (See Appendix A). The interview rating itself consisted of a simple decision of "Yes" or "No" to advance to Basic Submarine School and a set of descriptive comments to support the decision. The following is an example of a "Yes" decision:

> "An excellent man. Worked on submarines in Mare Island and was impressed by caliber of submarine men. Good school and job history. Wants to be a career man. Broken home by divorce, but seems to have made a fine adjustment. No evidence of tension."

An example of a "No" devision:

> "Very poor family background--also shows aggressive

tendencies. However, he has a good deal of drive and made a fine achievement in spite of educative and economic handicaps. May be a disciplinary problem. Also G. I. upset.

To determine the internal consistency of each interviewer's judgments with those of other interviewers, the interview soundscripts were played back during a session in which the inte4viewers could arrange to listen to playbacks of the interviews together. All the information on the interview card, which was available at the time of the original interview, was again made available to the group during the playbacks. The original interview comments and the overall decision made by the interviewer on the report form had been concealed. Each interviewer present was instructed to evaluate the interviewee, or re-evaluate the interviewee as the case might be, on the basis of the playbacks. The former provided the means for determining inter-rater consistency, or the degree of correspondence between different interviewers' judgments, and the latter provided the means for determining intra-rater consistency, or the degree of correspondence between the original evaluation and the re-evaluation of the same cases by the same interviewer. Unfortunately, it was not possible to regulate the interval between evaluations and re-evaluations; it probably varied from one month to four or five months.

The determination of the reliabilities with respect to the overall decision was a simple matter of the percentages of decisions in agreement. However, clearly, a systematic yardstick for dealing with the unstructured interview comments was needed. In the service of isolating the relevent traits, a rating form had been developed out of the comments made on the 109 interviewees of the recorded sample and also on an additional sample of 573 interviewees from the unrecorded group. The principal traits which were apparently being evaluated unstructuredly were included thereon and certain illustrative types of evidences, both favorable and unfavorable, which may have entered into the evalua-

tion of each trait were enumerated under each trait. The first interview report form, as it was constructed at that time and put into use is exhibited as Appendix B, and further elaboration of its development is given under D. Isolation of relevant traits in this section.

The matter of determining the intra-rater and inter-rater reliabilities of these comments was then thought to be most meaningfully done against the backdrop of the first interview form. The unstructured interview comments on the 109 interviewees in the soundscript sample, and their re-evaluations by the same interviewer, as well as their evaluations by other Medical Officer interviewers were "structured" on this first interview report form. The determination of the reliabilities then became a matter of obtaining for each trait on the interview report form, the percentages of agreement in rating positions on the four-point scale, between each pair of interviewers and between the pairs of evaluations by the original interviewer himself of the same candidate.

5. Aids to the Interview

Two instruments were in use as aids to the interview. One was a personal history inventory called "The Confidential Questionnaire", the other, "The Submariner Stereotype" represented the application of a special measurement technique involving the double administration of a set of words or phrases, once in the frame of reference of the respondent's own self-picture, and second, in the frame of reference of the submariner. Detailed accounts of the study of these two instruments, including findings on reliability and validity, were prepared under separate cover: "The Interview: II. Aids to the Interview - The Confidential Questionnaire", and "The Interview: III. Aids to the Interview - The Submariner Stereotype."

C. Validity

Pass-fail data were obtained from the Basic Submarine School

for the 682 submarine candidates in the total "population" passing through the Laboratory during the period of 15 March 1951 to 15 July 1951. The pass-fail data were computed for the predictive efficiency of each interviewer and for the group of interviewers as a whole. Because candidates are sometimes identified as borderline cases by the interviewers, a supplementary analysis was made of the performance of this group.

2. and 3. Prediction of success in submarines and the relationship of the interview to other predictors.

It will be noted that it was not possible to explore the questions of ultimate validity and the relationship of the interview to other predictors, due to the lack of time and the lack of criterion data.

4. Aids to the Interview

The two aids to the interview, the Confidential Questionnaire and the Submariner Stereotype, were also tested for their power to differentiate the successful candidates from those who were unsuccessful in the Basic Submarine School. Validation involved the identification of three groups of unsuccessful cases--academically disqualified, temperamentally disqualified, and physically disqualified, and the comparison of the data for each of the three disqualified groups with those of the successful group. The exact procedures are reported in detail in the two reports previously cited.

D. Isolation of relevant traits

The comments of interviewers on both the recorded and unrecorded samples were examined for identification of the principal traits which were being rated in an unstructured manner. Those which recurred were identified principally as five: Personal Adjustment, Adjustment to Navy Life, Motivation, Interest in Submarines, and Aptitude for Submarines.

Illustrative evidence cited in the interviewers comments, both favorable and unfavorable, which may have exemplified the presence and quantity of each trait, were gathered and listed for each of these traits inside of the form.

The use of this report form during a period of three to four months showed a need for revision. Comments made in the space provided for "additional comments" were incorporated as evidences and a middle category for the evidences was added. This first revision of the interview report form is exhibited as Appendix C.

RESULTS

The findings for each major area of the investigation will be discussed in the same manner of organization under their respective headings.

A. Background Survey of the Literature

The general survey of the literature on the interview reveals that the following statements are documented:

(1) The interview continues to be popular as a screening and selection technique despite some negative evidence pointing to its very small contribution in well-rounded selection programs using other tools and techniques;

(2) The value of the interview is believed to lie in such evaluative matters as the gathering of a life history, and the unique opportunity to organize facts from various sources, and in such non-evaluative functions as establishing friendly relations, according personal treatment, and giving information;

(3) The reliability and validity of the interview are highly specific to a given situation, due to such factors as the specificity of interviewer skills in both interviewing and evaluating and the specificity of interpersonal relationships, the specificity of purposes for the inter-

viewing, and the like.

(4) The reliability and validity of the interview are a function of the following variables:

(a) The interviewers' training;

(b) The interviewers' knowledge of job specifications;

(c) Theinterviewers' agreement on criteria of evaluation;

(d) The amount, reliability and validity of antecedently collected objective data available to the interviewer;

(e) The conduct of the interview in a semi-structured manner which has been agreed upon by the interviewers;

(f) The inclusion of traits for assessment in the interview which have been demonstrated to be related to success in the activity;

(g) The judgment of traits in terms of their manifestations as characteristics of specified groups, rather than as abstractly conceived phychological qualities.

(h) The availability of adequate criteria against which to evaluate the predictive efficiency of the interview;

(i) The degree of restriction in the range of applicants on the traits to be rated;

(5) Such traits as the following are thought to be ratable in a patterned interview, and to be largely unmeasurable by other means: energy, social adjustment, emotional control, and conscience.

With regard to the findings on the interview in the Armed Forces, these are observed to differ for the different branches of the service. This is in line with the specificity of interview validity, in general, and also the related factors of the different types of interviews conducted throughout the military--induction, classification, neuro-psychiatric, and the like--on different groups of different sizes.

Inasmuch as fairly detailed abstracts of the studies are included in the initial report of this series, "The Interview I. A Selectively Abstracted Bibliography", only the conclusions reached for each branch

of the service will be summarized here. The footnotes will provide the reader with the exact source of the study preceded parenthetically by the entry number to the abstract of this source in the abstracted bibliography.

In the Army the brief clinical interview in induction screening was found to be effective in predicting adjustment to the Army, and the findings indicated to the investigator that in the case of "doubtfuls", a chance should be taken.[1]

Also, while very brief psychiatric examinations detected unsuitables among enlisted personnel, a longer psychiatric examination detected more unsuitables.[2] Further, brief psychiatric interviews on replacements to rifle companies predicted combat effectiveness with a moderate degree of success.[3]

In the Army Air Forces, on the other hand, studies of the interview in the selection of aircraft pilot have led to the conclusions that the clinical interview adds little to a testing program[4], and identifies only the most serious disorders[5].

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[1](3) Aita, J.A. Efficacy of the brief clinical interview method in predicting adjustment, Arch. Neurol. Psychiat., 1949, 61, 170-176.

[2](67) Hadley, E.E. et al - An experiment in military selection. Psychiatry, 1942, 5, 371-402.

[3](65) Glass, A.J. An attempt to predict probable combat effectiveness by brief psychiatric examination. Amer. J. Psychiat., 1949, 106, 81-90.

[4](43) Dunlap, J.W. and Wantman, M.J. An investigation of the interview as a technique for selecting aircraft pilots. CAA Airman Development Div. Report No. 33, Washington D.C., Aug. 1944, Pp 63.

[5](78c) Gillespie, R.D. and Reid, D. D. Prediction of failure in flying training and in operations by the brief psychiatric interview. FPRC No. 641, September 1945.

In the Navy, neuropsychiatric examination and psychometric examination of recruits were both reported to predict about the same percentages of eventual training station discharges, but the tests produced more 'false positives', i.e., individuals who are screened out by the test but who are found to be capable of service.

In connection with the selection of reserve cadets in the Coast Guard, the reliability of the interview is found to be greatest as shown by a large number of perfect agreements, in the case of the lowest interview ratings.[2] When the general effectiveness of the selection program is explored against a criterion of success in a training program, it is found that ability tests of numerical, verbal and spatial abilities and the personal interview were almost equally efficient predictors, but the combination was superior to either alone [3].

In the Marines, the validity of the interview was estimated by efficiency in picking men able to survive the eight-week training period. By means of the interview, most of the unfit were identified and only 22 per cent of the unfit were missed[4].

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[1](148) Wittson, C.L. and Hunt, W.A. Three years of naval selection: A retrospect. War Med., 1945, 7, 218-221.

[2](101) Newman, H., Bobbitt, J.M. and Cameron, D.C. The reliability of the interview method in an officer candidate evaluation program. Amer. Psychologist, 1946, 1, 103-109.

[3](49) Felix, R.H. et al. An integrated medico-psychological program at the U.S.Coast Guard Academy, preliminary report. Am. J. Psychiat., 1945, 101, 635-642.

[4](95) Miles, D.W. et al. The efficiency of a high speed screening procedure in detecting the neuropsychiatrically unfit at a U.S.Marine Corps Recruit Training Depot. J. Psychol., 1946, 21, 243-268.

While it might perhaps be considered fitting to delve into these studies for their strengths and limitations in order to qualify the findings, as expressed above without interpretation, it does not seem appropriate to the investigators to cite these here. Admittedly, the study of the interview in a scientific manner is an exceedingly difficult task, although none the less challenging because of this. The methodology involved in the study of the interview in its natural setting is difficult to exercise and the investigator is confronted with the problem of the adequacy of the available criteria against which to validate the interview. It is recognized that it is highly problematical in such studies as are made of the interview, whether the factors, which lend reliability and validity, as enumerated previously, were observed or indeed, were observable. It seems that in the military, as well as in industry, truly adequate studies of the reliability and validity of the interview have not been made.

Rather it might be well to dwell on a thought which had particular pertinence to the present investigation. There is observed a trend in the literature, especially with regard to the military, of presenting the findings on the interview in terms of comparative predictive values with test measures of both aptitudinal and personality types. However, if the interview represents the point at which all data on interviewees are expected to be properly synthesized, as in the case in the submarine service, it becomes highly problematical to conceive of findings on the interview "alone". As enumerated previously, the findings on the interview are a function of variables both antecedent and subsequent to the interview as well as inherent to the interview situation. Investigation of the interview therefore demands a very comprehensive research design to encompass these variables. The difficulty in the phrase "the interview 'alone'," notwithstanding, a relatively unique evaluative function to the interview need not be denied. It would appear that the interview can be directed to the prediction of some elements which are required for success in a given activity, which are relatively independent of

what other instruments measure, and which are largely unmeasurable by other measures. These elements might be factors in personal and social adjustment, if these have been demonstrated to be related to success. Conversely, estimates of aptitude, such as are made in the interview by means of the proper synthesis of obtained measures, can be made relatively independently of other traits required for success, i.e. personal and social adjustment traits. Thus, the interviewer may appropriately judge and weigh these dual factors of aptitude and personal and social adjustment, if they are both demonstrated to be related to success in a given activity, and he may synthesize the result in his overall evaluation.

Such considerations as these entered into the development of the two interview report forms which were put into use during the present investigation, and which are exhibited as Appendixes B and C. It will be observed that the interviewer evaluated "Aptitude for Submarine Service" and factors in personal and social adjustment. Such evidences as GCT and Mechanical Test were cited as evidences to support the judgments of aptitude, while the remainder of the form taps areas previously unevaluated.

B. Reliability of the Interview

1. Interview Content

The findings on the application of the scheme devised for content analyzing the 109 collected interview soundscrips are set forth in Appendix D, Table1. The results are indicated there for the total group of soundscripts, as well as separately for each participant interviewer. Unfortunately, time limitations did not permit the estimation of the reliability of these data, i.e., consistency of the content analyzer. However, the investigator who developed the scheme from auditing of the soundscripts also applied the scheme to the soundscripts; this factor, coupled with the generally high reliability for simple present-absent type content analyzing, would lend support to the estimate that the reliability or consistency of the findings would be sufficiently high to trust

the present results as summarized.

From these summary data in Appendix D, Table 1, Table 4 has been derived and shows the relative degree of consistency in the coverage of the existent subject matter during the period 15 March 1951 to 15 July 1951.

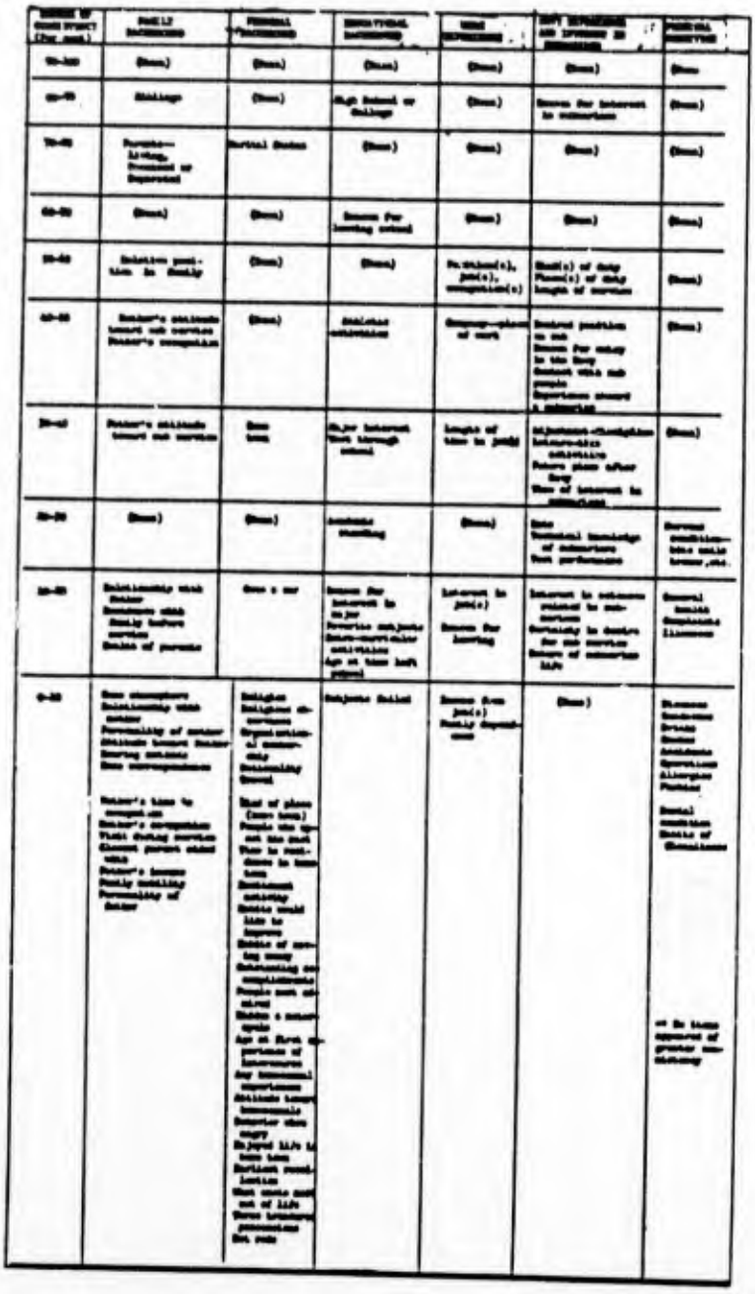
From the data in Table 4, it can be seen that the items which attained the greatest degree of consistency in coverage throughout the 109 interviews are the following, in order of descending reliability:

Item	Degree of Consistency in per cent
1. Establishment of attendance at high school or college	86
2. Reason for interest in submarines	83
3. Whether the candidate had any brothers or sisters	81
4. Marital status	75
5. Establishment of whether candidate's parents were living, dead, or separated	70
6. Reason for leaving school - graduated, join the Navy, etc.	64
7. Position(s), job(s) or occupation(s) held pre- or post-graduation	56
8. Kinds of duty held in Navy	55
9. Relative position in the family amongst siblings or only child	54
10. Place(s) of duty in the Navy	50
11. Length of service	50

It is observed that the items of greatest consistency in coverage are primarily of the factual, biographical type. From the remaining data in Table 4, it is observed that the items of lowest consistency are abundantly of the attitudinal type.

These findings suggest the interpretation that the interviewers were pursuing factual information without sufficient subsequent probing into attitudes, which may prove to be important in assessment. In their

Table 4.- The relative degree of consistency in the coverage of existent subject matter throughout 109 interviews with candidates for the submarine service during the period 15 March 1951 to 15 July 1951.



defense, occurs the possibility that the factual-type items can be viewed as necessary for the building and establishment of rapport. As only a rough support to the guess that this was not likely in this instance, data were gathered which noted the pattern of opening remarks made by each interviewer. It was impossible to carry the analysis any further along in the interview due to the extremely unstructured nature of these interviews at the time.

In Table 5 are summarized the frequencies and percentages of the total number of interviews which were opened by the given opening inquiries. Comparative percentages are also given of the degree to which each opening remark was elicited as content.

Table 5.- Frequencies and percentages of the total number of interviews which used given opening remarks and the comparative percentages of the degree to which each was elicited as content throughout the 109 interviews

Item	Occurrence as opening		Occurrence as * Content Percentage
	Frequency	Percentage	
Length of service	39	36	50
Reason for interest in subs	17	16	83
Home town	14	13	34
Places of duty	9	8	50
Kinds of duty	8	7	55
Time of interest in subs	6	6	34
High school or college	2	2	86
Reason for entry into Navy	2	2	43
Birthplace	2	2	9
Any special physical complaints	2	2	12
Rate	2	2	23
General health	1	1	17
Headaches	1	1	5
Nationality	1	1	4
Marital Status	1	1	75
Reason for leaving school	1	1	64
Academic standing	1	1	25

* From the content analysis data in Appendix D - Table 1.

Comparison of the entries in the two percentage columns in Table 5 shows a very small proportion of the coverage of the factual-type items may be said to represent with some justification, perhaps, the rapport building objective. Further evidence, however, serving to decrease the justification is given in the observation that these questions were not leads to greater probing in related areas as reflected by the low percentages of occurrence on the attitudinal type questions related to them.

These frequently mentioned items are, therefore, rightly regarded as genuine information--eliciting. It is noted that, of the 11 items abstracted earlier from Table 4, only six (starred) may not have been derived from the other data available to the interviewer from the interview report card or the Confidential Questionnaire. Yet, in another sense, even this may be defensible under some circumstances where attitudes may be reflected in the manner of response to such straight-forward questions. However, considering the pressure of the time available for the interviews with the candidates for the submarine service, and therefore, what the optimal time expenditure might be for obtaining various kinds of information, it appears unlikely that attitudes reflected in the manner of response to such factual questions would prove diagnostic without the further probing indicated.

On the positive side, a genuine and consistent attempt is made to assess each candidate's motivation for submarine service. To a much lesser extent, is some attempt made to assess their adjustment to Navy life. Certainly, however, some of the less frequently occurring items in these connections are potentially of sufficient importance to the submarine service as to be used with much greater consistency, i.e. qualities of a submariner, qualities the individual has to offer submarines, and the like.

2. Time Analysis

The measurement of relative proportions of interviewer speaking time, interviewee speaking time, "dead", and total interviewing time, yielded an analysis of these indices for the total group of 109 soundscripts as well as for each interviewer. These data are summarized in Table 6 on page 28.

With regard to the reliability of these data, the correlation between the measures obtained on the original take (on which the summary is based) and the re-take for every fifth case is as follows for each index:

Interviewer Speaking Time	.9912
Interviewee Speaking Time	.9983
Total Time	.9986

Clearly, the method of measuring these speaking times proved to be highly reliable.

In view of the reliability of the data in Table 6, therefore, there is considerable variation in the speaking patterns of conducting the interview among the six interviewers. Interpretively the following statements appear descriptive for each interviewer:

Interviewer A: Spoke for about the average proportion of interviewer speaking time; his interviewees also spoke in average proportions; there was average "dead" time in his interviews; finally, average total interviewing time was less than average and lowest of the interviewers.

Interviewer B: Spoke least; there was average interviewee speaking time; most "dead" time of all interviews; total interviewing time was close to average.

Interviewer C: Speaking time more than average; less than average "dead" time; interviews were longer than average, but also the most variable.

Interviewer D: Spoke slightly more than average; average interviewee

Table 6.- Average total interviewing time and the average relative proportions of interviewer and interviewee speaking time, the ratio of interviewee speaking time, and average "dead"* time for each interviewer and the total 109 interviews

Interviewer Code	N	Average Total Interviewing Time per Interview	Average Proportions of Speaking Time per Interview				Average Total "Dead" Time per Interview
			Interviewer	Interviewee	Ratio Interviewer / Interviewee		
					Mean	Median	
A	43	6' 16"	.23	.52	.58	.45	.25
B	21	8' 14"	.19	.51	.39	.36	.31
C	20	12' 4"	.33	.46	.83	.70	.21
D	15	8' 33"	.28	.49	.61	.57	.24
E	5	15' 47"	.22	.59	.40	.41	.19
F	5	11' 9"	.34	.45	.87	.74	.21
Weighted means for total set of interviews	109	8' 41"	.25	.50	.60	.48	.25
Range		6'16"-15'47"	.19 - .34	.45 - .59	.39 - .87	.36 - .74	.19 - .31

* "Dead" time is time expended without either interviewer or interviewee speaking. It is understood that this time was probably spent in scanning the record of the candidate, preparing for inquiries, etc.

speaking time; and average "dead" time. Pattern of conduct on these measures most closely resembles that of the average of the whole set of interviews.

Interviewer E: Spoke less than average and there was almost as much "dead" time; greatest interviewee speaking time; average total interviewing time was the greatest.

Interviewer F: Spoke most on the average with least interviewee speaking time, less than average "dead" time and above average total interviewing time.

As a corollary to the above interviewer descriptions, on an overall basis, it is noted that the shorter interviews expended the greater "dead" times. While the shorter interviews are characterized by average interviewee speaking times, they are also characterized by both above and below average interviewer speaking time.

Apparently, therefore, the shorter interviews fail to meet two desirable features of interviewing, namely, efficient use of the available time and having the interviewee do the talking.

The averages of the ratios of interviewer speaking time to interviewee speaking time for each interviewer shows considerable variability from interview to interview. This is not at all unusual if the place of this variable, i.e., verbosity, among individual differences is kept in mind. However, it is noted that four out of the six interviewers, on the average spoke more than half as much as the interviewee. While there does not seem to be any agreed-upon optimal figures for such a measure, it is very doubtful that such high ratios are desirable, if the aim of the interview is to assess the interviewee. Indeed, the interviewers could probably profit by letting the interviewee do more of the talking, and permitting less "dead" time.

3. Intra-rater consistency

The findings on the application of the method for determining the intra-rater consistency, i.e., consistency of the individual interviewer's judgment, is set forth in Table 7.

Table 7.- Percentage agreement between evaluation and re-evaluation of cases by the same interviewer for overall decision, and for five trait ratings

Interviewer Code	N	Number Re-evaluated	% Agreement in Overall Decision	Pers. Adj.	Adj. Navy	Moti-vation	Int Subs	Apt Subs	
A	43	18	94	94	100	89	94	100	Excl.N.R.*
				89	89	44	72	62	Incl.N.R.**
B	21	5	100	80	100	60	100	100	
				60	60	60	100	100	
C	20	19	89	84	100	74	95	89	
				84	84	32	58	58	
D	15	2	100	100	50	50	50	100	
Total	99	44	93	89	100	80	95	95	
				84	82	41	68	57	

Examination of the data in Table 7 shows, first, that only 40 per cent of the cases in the soundscript sample were re-evaluated by the original interviewers by means of "play-backs". This limited number was due to the uncontrollable factor of the transfer of all the interviewers except interviewer C who was able to re-evaluate almost all of his interviews. On the basis of the 40 per cent re-evaluation, it is observed

* The percentages on the first line of these data are based on absolute agreements in the trait ratings excluding the instances where no response was made to the trait on either the original or re-evaluation, but includes the instances where no response was made on both as an "agreement".

**The percentages on the second line of these data are based on the absolute agreements in the trait ratings, including the instances where no-response was made on both as an "agreement", and including the instances of no-response on either the original evaluation or re-evaluation as an "inconsistency". These percentages are viewed as much more reflective of the concept of reliability than the former ones.

that on the average 93 per cent of the overall decisions were in agreement. However, it should be noted here that only a very small percentage of those interviewed are rejected, 5 per cent*. Since the selection ratio is quite high, then in general this degree of reliability is neither surprising nor any too high.

Directing attention to the three changes in overall decision, it is found that two of the three changes were from "No" to "Yes", while only one was from "Yes" to "No".

As for the individual trait ratings which were structured by one of the investigators along a four-point scale, considerable variation is indicated. Fairly high reliabilities (from 60-100 per cent consistency for the group as a whole) are indicated for individual trait ratings. It should be pointed out that this excludes the instances in which no indication of the trait judgment was made, either on the original evaluation or re-evaluation, but includes the instances where no mention was made on both, because the latter was considered a "consistency". When the instances of no mention are taken into account, however, the reliabilities drop into the range of from 41 to 84 per cent. The latter ranges are viewed as more reflective of the reliability concept than the former ones.

Parenthetically, it is of interest to note that, of the total number of inconsistencies of the no-response type, 56, 35 were in the direction of no-response on the evaluation to some indication made on the re-evaluation; and only 21 were rated on the evaluation but not on the re-evaluation. Incidentally, this trend was observed to be most pronounced for the trait, Aptitude for Submarines; in other words, the low reliability of 57 per cent for this trait, seems to consist mainly in the failure to report on Aptitude for Submarines in the original evaluation, but a tendency to report and, therefore, attend more heavily to aptitudinal factors in the re-evaluation situation. This may be a result of the "play-back"

* From the validity data in Table 9.

situation where the person being evaluated is absent and the interviewer is left merely with the voices of the original interview situation.

Several noteworthy problems attached to the concept of reliability of the interview are reflected here. To recapitulate the observation, it appears that the interviewer, having rated the traits in the original instance, tended to re-observe and re-evaluate them. In retrospect, however, he was able to observe and rate some of the traits originally unobserved and/or not rated.

In one sense, this trend may be indicative of the training value which was derived from listening to the play-backs as well as from the ongoing research program. However, it also raises important theoretical questions concerning the intra-rater reliability of the interview. Is an interviewer likely to be able to observe, to perceive, and therefore, to rate more in a re-evaluation situation than in the original evaluation situation? While this trend was found using the play-back research design, it is quite possible that this trend would inhere in the much more preferable research design, if it were administratively feasible, of having the same interviewer re-interview the same candidate and re-evaluate him. This problem is even more provocative, when it is remembered that if the more conventional prescribed and/or structured rating form is used in any reliability research design of the interview, this perceptual problem is not likely to be reflected in the data. In both instances of evaluation and re-evaluation, a report is made when the trait is suggested on the form. Reliability, then is reflected for reports made at the dictates of the form, rather than reports made at the dictates of the situation.

4. Inter-rater consistency

The findings on the application of the method for determining inter-rater consistency, i.e. the consistency of the judgments of each interviewer with those of the other interviewers, are presented below in Table 8. It will be observed that three newly assigned Medical

Officer interviewers, besides those involved in the original set of 109 soundscripts, evaluated some of the recordings of the original interviewers. This was done as part of their initial training program.

Table 8.- Percentages of agreement between the evaluations of cases by the original interviewer and the evaluations of the same cases by other interviewers for the overall decision and for five trait ratings.

Interviewers Code	N	Number Re-eval.	Overall Decision	Pers. Adj.	Adj. Navy	Motiva- tion	Int.in Subs	Apt.for Subs	
A				77	100	67	100	100	Excl.N.R.*
and B	43	9	89	77	67	44	44	44	Incl. N.R.**
and C		38	100	79	76	74	89	100	
				71	71	29	55	42	
and D		4	100	100	100	75	100	100	
				75	75	25	75	75	
and G		15	100	93	93	80	100	100	Excl.N.R.*
				13	67	27	67	47	Incl.N.R.**
and H		10	100	80	100	90	100	100	
				60	60	30	60	80	
and I		7	100	100	100	100	100	100	
				29	29	29	71	43	
B	21		100	67	100	67	100	100	
and A		3		67	67	0	33	33	
and C		9	100	56	100	89	100	78	
				56	56	33	56	44	
C	20	6	100	100	100	100	100	100	
and A				83	67	33	50	50	
and B		7	100	100	100	86	100	100	
				100	71	29	71	57	
and H		10	80	60	100	80	80	100	
				60	70	40	20	40	
and I		9	100	77	100	89	78	100	
				[illegible]	33	56	44	56	
Average for Total Group		127	98	81	92	81	78	98	
				61	63	32	54	71	
	Ranges		80-100	56-100	76-100	67-100	78-100	78-100	Excl.N.R.*
				13-10	29- 75	27- 56	20- 75	33-80	Incl.N.R.**

*The percentages on the first line of these data are based on absolute agreements in the trait ratings excluding the instances where no response wase made to the trait on either the original or re-evaluation, but includes the instances where no response was made on both as an "agreement".

**The percentages on the second line of these data are based on the absolute agreements in the trait ratings, including the instances where no-response was made on both as an "agreement", and including the instances of no-response on either the original evaluation or re-evaluation as an "inconsistency". These percentages are viewed as much more reflective of the concept of reliability than the former ones.

Inspection of the data in Table 8 shows first, only 127 or 15 per cent of the possible total number of inter-interviewer evaluations (872) were made. Hence, the findings may be viewed only as suggestive of possible trends.

It is seen that there is a very high degree of consistency among raters with regard to the overall decision--98 per cent agreement on the average. All three of the disagreements happened to be in the No to Yes direction; the original interviewer did not accept the candidate, but the re-evaluator did. Again, since only a very small percentage of the candidates are rejected, this high degree of reliability is to be expected.

Diagnostically, therefore, it might be well to "unmask", as it were, the indicated high reliabilities of the overall decision. Qualitatively, the interview comments by different interviewers had shown signs of considerable variability in individual trait judgments from interviewer to interviewer. When their comments were "structured" along the first interview report form, from Table 8 it is seen that the inter-interviewer agreement on a group basis for the five traits ranges from 78 to 98 per cent, excluding instances of no response, and 32 to 71 per cent, including instances of no response.

Notwithstanding the high reliability of the overall decision, considerable variation in what may best be termed "standards plus reporting" did exist. Thus the first interview report form was designed and instituted to overcome at least this kind of unreliability which was demonstrated as present in the assessment interview as it was being conducted.

5. Reliability of aids to the interview

In brief, here, findings on the investigation of thereliability of the two aids to the interview, the Confidential Questionnaire and the Submariner Stereotype revealed:

(1) Fairly high and acceptable reliabilities for factual type items on the questionnaire;

(2) Low and unacceptable reliabilities for items of the non-factual, or attitudinal type, on the questionnaire.

(3) Acceptable reliability for most items on the Submariner Stereotype.

C. Validity of the interview

1. Prediction of success in Submarine School

Investigation of the predictive efficiency of each interviewer in the processing of a group of 682 submarine candidates during the period of 15 March 1951 to 15 July 1951 yielded the summary presented in Table 9.

Table 9.- The total number of interviewed, accepted and rejected submarine candidates during the period 15 March 1951 to 15 July 1951, and the efficiency of the predictions for each interviewer and the total group of interviewers

Interviewer Code	Interviewed Total	Accepted			Rejected					Unidentified
		Total	Per cent Pass,	Per cent Fail	Total	Per cent P.D.*	Per cent A.D.+	Per cent T.D. ‡	Per cent Pass**	
A	208	184	96	4	24	67	13	21	40	
B	129	115	98	2	11	73	0	27	33	3
C	108	96	90	10	10	80	0	20	0	2
D	72	67	91	9	5	60	0	40	0	
E	44	40	100	0	2	0	0	100	0	2
F	19	16	100	0	2	50	50	0	100	1
J	53	47	96	4	6	33	0	67	0	
K	13	13	92	8	0	0	0	0	0	
L	12	12	83	17	0	0	0	0	0	
M	7	7	100	0	0	0	0	0	0	
Others Unidentified	17	9	89	11	1	100	0	0	0	7
Totals	682	606	575	31	61	39	18	4	4	14
%		89	95	5	11	64	7	30	18	

* Physically disqualified
\+ Academically disqualified
‡ Temperamentally disqualified
** Largely temperamentally disqualified at interview but permitted a chance and passed

Examination of the data in Table 9 shows that, on the whole, the interviewers identify those likely to pass Submarine School with 95 per cent success and 5 per cent inaccuracy. For individual interviewers, the predictive efficiency ranges from 83 to 100 per cent.

Inasmuch as the interviewers were earmarking borderline cases and these were being permitted to attend Submarine School, then the foregoing validity data need to be supplemented with an analysis made in terms of the borderline cases. In Table 10 below are presented the data on identified borderline cases for each interviewer and for the group of interviewers as a whole.

Table 10. - The total number of interviewed, accepted cases who were identified as borderlines and the percentages of these cases who graduated and did not graduate from Basic Submarine School

Interviewer Code		Total	Accepted Number of Borderlines	% Passed	% Failed	% of His Total Number of Failures Identified as Borderline
A		184	28	86	14	57
B		115	12	100	0	0
C		96	21	90	10	20
D		67	3	100	0	
E		40	6	100	0	
F		16	1	100	0	
J		47	9	89	11	50
K		13	4	75	25	100
Total Group	Number	606	84	76	8	31
	Percentage		14	91	9	26

It is observed from the data in Table 10 that, of the 14 per cent of the accepted candidates who are identified as borderline, 91 per cent succeed in graduating from Submarine School and 9 per cent fail academically. Apparently, taking a chance on the "borderlines" is not wasteful.

Now, the 5 per cent who are accepted, but who fail academically on an overall basis, it is found that 26 per cent had been judged as borderline by the original interviewer, and of the 95 per cent who are accepted and pass academically, 13 per cent had been judged as borderline by the original interviewer. Again, considering the carefully preselected nature of the submarine candidate group and the high selection ratio, this high degree of forecasting efficiency should be regarded as an acceptable minimum of validity which should be maintained and improved upon, if possible, by observing the factors related to reliability and validity, as summarized earlier in Section A of these results.

D. Isolation of relevant traits

The first interview report form as exhibited in Appendix B constituted the first approximation of the isolation of relevant traits. In the interests of communicability and ease in rating, these were identified as five: personal adjustment, adjustment to Navy life, motivation, interest in submarines and aptitude for submarines. After an internal check-off analysis, evaluation of each trait was made along a 4-point scale: definite reject, conditional pass, definite pass, and outstanding pass. An overall judgment was then made on a 4-point scale: recommend unqualifiedly, recommend, recommend with reservations, reject. Space was also provided for additional comments.

It is added here that the staff of the Medical Research Laboratory continued to develop the matter of isolating relevant traits on the basis of this start, and the present rating scheme is a compilation and definition of these five traits and two additional ones—maturity and intelligence.

SUMMARY EVALUATION

Investigation of the reliability and validity of the assessment interview in the screening and selection of submarine candidates leads to the following conclusions:

A. Reliability

(1) Interview content - A high degree of consistent coverage indicated for factual type items of questionable assessment value, and available on other forms; low consistency in the coverage of attitudinal type items not available on other forms which may prove diagnostic.

(2) Time analysis - Considerable variation in the pattern of speaking time expenditures of the interview and the interviewee, "dead" time and total interviewing time. The data indicate the need for more interviewee speaking time and less "dead" time.

(3) Intra-rater consistency - High reliability in overall decision is suggested but considerable variation is indicated in individual trait ratings, best described as "standards plus reporting".

(4) Inter-rater consistency - High reliability in overall decision is suggested but great variation is indicated in individual trait ratings, best described as "standards plus reporting".

(5) Aids to the interview - High reliability for factual items but low reliability for items of the personality characteristic type on the Confidential Questionnaire; acceptable reliability for most items of the Submariner Stereotype.

B. Validity

(1) The Assessment Interview - Interviewers are predicting graduation from Submarine School with 95 per cent accuracy and 5 per cent inaccuracy. However, of the latter, 26 per cent had been identified as borderlines, and of the former, 13 per cent had been identified as borderlines. Therefore, in the case of borderlines, a chance may be taken.

(2) Aids to the interview - predictive value indicated for items

showing educational attainment on the Confidential Questionnaire using the criterion of graduation from Basic Submarine School; no interpretable predictive value indicated for present items of the Submariner Stereotype using the same criterion, the adequacy of which, however, is questionable for the technique.

The significance of these findings is that although the predictions of the assessment interview as it was being conducted at the Medical Research Laboratory were quite accurate, this is partially an artifact of an unusually high selection ratio. Improvement in the general pattern of conducting the interview may be indicated by the following measures:

(1) By employing the information available on the Confidential Questionnaire to a greater extent as pre-interview content to be scanned in obtaining information about the candidate;

(2) By judiciously using the validity indicated for the item of educational attainment on the Confidential Questionnaire as the particular situation demands;

(3) By devoting the available interviewing time to potentially more diagnostic attitudinal-type inquiries;

(4) Concurrently, by letting the interviewee do more of the talking;

(5) By using such semi-structured rating forms as were developed as a result of the present investigation;

(6) By isolating the traits relevant to success in the submarine service and clarifying their meaning and methods of identification from interviewer to interviewer.

SUGGESTIONS FOR FURTHER RESEARCH

Probably the most crucial aspect of the present research which was not explored involves obtaining measures of performance of individuals in the submarine fleet itself. This ultimate criterion measure is obviously the one against which the assessment interview, as well as the other predictor measures, must be checked. A kindred problem

involves the determination of the relative uniqueness of the assessments made in the interview. This calls for a correlational study of the interview with other existing or contemplated assessment techniques, e.g., the psychological tests comprising the Basic Navy Battery.

While the above are problems untapped within the scope of the present study, other problems suggest themselves as outgrowths of the investigation. For example, now that the interview is a semi-structured form, it would be desirable to know: (1) the relative amount of overlap among the individual traits presently being rated; (2) the degree of relationship between the ratings on each trait and the overall assessment; (3) the degree of the relationship between the ratings on each trait and the overall assessment with performance in Basic Submarine School.

Other avenues of research on the interview are:

(1) Educational methods for increasing the reliability and validity of interviewers' predictions;

(2) The characteristics which differentiate successful and unsuccessful interviewers;

(3) The formulation of questions which will elicit information useful in the assessment of prospective submariners;

(4) Time indices as possible predictors of interviewer performance;

(5) Methods for reporting the results of the interview for optimal reliability and validity.

Keynotes for research in this area should be: (1)Comprehensive design to explore the many facets of the interviewing problem; and (2) Temporal continuity to insure that cognizance is taken of changes in manpower resources and requirements in the submarine fleet.

APPENDIX A

Interview Report Form in Use at the Medical Research Laboratory upon Activation of the Present Investigation.

NSBNL—5-29-51—4M

Name: _____ (Last) (First) (Middle)

Rate or Rank: _____ Ser. No. _____

Date of Exam: _____ Date Born: _____

Place of Birth: _____

NAVAL RESERVE ONLY

Civ. Occup: _____ Naval Dist: _____

Reserve Unit No: _____ Loc: _____

Vision	R /20	L /20	
Recheck	R /20	L /20	
Color Vision	Plates: Lantern: Dichot:	Qualified: ☐ Not Qual: ☐	
Hearing	WV /15 CC /20	WV /15 CC /20	

Audiometer	256	512	1024	2048	4096	8192
Decibels Loss: Right						
Left						

Activity Desiring Exam: _____

Purpose This Exam: _____

Status: _____

Age: _____ Length of Service: _____

Previous S/M Duty: _____ yrs. _____ mos.

Number of War Patrols: _____

Educ. Completed: _____

GCT:- _____ ARI:- _____ TOTAL:- _____

PI: _____ 1. _____ 2. _____

MECH:- _____ CLER:- _____ MKE:- _____ MKM:- _____

OFFICER: _____ VERBAL: _____ ELEC-MECH: _____

O.C.T: _____ MATH: _____ SP: _____ PI: _____

NV: RAD: SON:

TANK: 1- _____ MARK: _____

2- _____ MARK: _____

3- _____ MARK: _____

X-Ray No. NB7 _____ Date: _____

Blood Kahn:- _____ Date: _____

Urinalysis: 1- _____ Date: _____

2- _____ Date: _____

3- _____ Date: _____

Nose: _____

Throat: _____

Ears: _____ Wax-Rt. _____ Lt. _____

Height: _____ Weight: _____

Lungs: _____

Heart: _____

Abdomen: _____

Hernia: _____

Nervous System: _____

Extremities: _____

Joints: _____

Hemorrhoids: _____

Venereal: _____

Skin: _____

Glands: _____

BP: P: Recheck BP: P:

Medical History:

Source	Motiv	Intell	Psych	Phys	Sens

Decision:

M. O's Remarks:

Info. for M.O. _____

_____

_____

_____

_____

_____

APPENDIX B

First Interview Report Form Instituted During the Present Investigation

INTERVIEW FORM

Interviewee:_____ Serial:_____

Interviewer:_____ Date: _____

Directions: - - - You are asked to rate the man on each of five traits and also on your overall judgment. So that words may mean the same thing to different examiners, examples of unfavorable and favorable evidence have been listed under each trait. These lists are suggestive not definitive. The number of boxes checked under a particular heading does not add up to a score. A man may be rated "Outstanding Prospect" with relatively few items checked. Another man may be rated "Definite Reject" with the same number of check marks. You are asked to check the evidence you observe and to add any observed evidence not listed.

SUMMARY

	Def.Rej.	Cond.Pass	Def.Pass	Out.Pass.
Personal Adjustment	☐	☐	☐	☐
Adjustment to Navy Life	☐	☐	☐	☐
Motivation	☐	☐	☐	☐
Interest in Submarines	☐	☐	☐	☐
Aptitude for Submarines	☐	☐	☐	☐

OVERALL JUDGMENT:

- ☐ Recommend unqualifiedly
- ☐ Recommend
- ☐ Recommend with reservations
- ☐ Reject

1. Personal Adjustment

Definite Reject	Conditional Pass	Definite Pass	Outstanding Prospect
☐	☐	☐	☐

Unfavorable | Favorable

Physical Factors

- ☐ excessive sweating;
- ☐ tremors; nail biting;
- ☐ masked evasiveness of manner;
- ☐ unkempt; unclean;
- ☐ underdeveloped;
- ☐ effeminate build;
- ☐ too neat;
- ☐ normal tonus;
- ☐ good physique and carriage;
- ☐ good posture;
- ☐ normal equilibratory responses;
- ☐ clean and well groomed;
- ☐ skin in good condition;
- ☐ not too neat;

Additional Evidence: _____

_____

_____

Psychiatric Factors

- ☐ immature outlook;
- ☐ goals unrealistic;
- ☐ fails to face reality;
- ☐ emotions of child;
- ☐ undue anxiety over future;
- ☐ disorganized personality;
- ☐ lacks confidence in sex role;
- ☐ mature perspective; goals realistic;
- ☐ controlled emotional responses;
- ☐ cohesive organized personality;
- ☐ assurance in sex role;

Additional Evidence: _____

_____

_____

Psychological and Sociological Factors

- ☐ gross family instability;
- ☐ broken home;
- ☐ 'wife trouble';
- ☐ marked sibling rivalry;
- ☐ history of psychiatric complaints in family;
- ☐ over-dependence on family;
- ☐ normal home and home life;
- ☐ relatively independent of parents;
- ☐ health history of family normal;
- ☐ adapted well to undesirable family situation;

Additional Evidence: _____

_____

_____

2. Adjustment to Navy Life

Definite Reject	Conditional Pass	Definite Pass	Outstand Prospect
☐	☐	☐	☐

Factors from Man's Record

- ☐ Record of recurrent offenses;
- ☐ Has sought many changes of rate and station;
- ☐ clean record;
- ☐ meritorius mast; few changes in plans of rate and station;
- ☐ advancements in rate;

Additional Evidence: _____

_____

_____

Psychological Factors

- ☐ rebels against authority;
- ☐ carried chip on shoulder against Navy;
- ☐ no concern about own advancement;
- ☐ "non-reg" in appearance and manner;
- ☐ over-resentment at recall to duty;
- ☐ financial hardship at recall;
- ☐ accepts authority;
- ☐ military bearing and manner;
- ☐ wants to make Navy his career;
- ☐ concern about advancement;

Additional Evidence: _____

_____

_____

Social Factors

- ☐ "lone wolf" on job and on liberty;
- ☐ not accepted by shipmates;
- ☐ does not make friends easily;
- ☐ extreme extroversion;
- ☐ "team player";
- ☐ popular with shipmates;
- ☐ likes group functions;
- ☐ meets new people easily;
- ☐ not too extroverted;

Additional Evidence: _____

_____

_____

3. Motivation

Definite Reject	Conditional Pass	Definite Pass	Outstanding Prospect
☐	☐	☐	☐

Unfavorable | Favorable

Psychological Factors

- ☐ "grasshopper pattern";
- ☐ fails to follow through on tasks completion;
- ☐ energy level low - lethargic;
- ☐ does just enough to get by;
- ☐ no evident value pattern;
- ☐ fails to work up to level of aptitudes;
- ☐ "stick-to-it-iveness";
- ☐ high level of energy and well directionalized;
- ☐ stable and acceptable value pattern;
- ☐ accomplishes more than aptitude level warra :ts;

Additional Evidence: _____

_____

_____

Sociological Factors

- ☐ Fails to share group goals;
- ☐ selfish;
- ☐ negativistic;
- ☐ adjusts well in group operation;
- ☐ able to subserve personal goals;

Additional Evidence: _____

_____

_____

4. Interest in Submarines

Definite Reject	Conditional Pass	Definite Pass	Outstanding Prospect
☐	☐	☐	☐

Unfavorable

impulsive decision to "sign up";
romantic notion of life on board;
put in for subs to avoid difficult adjustment elsewhere;
never been on board;

Favorable

realistic picture of submarine based upon visiting on board;
friends or relatives in subs;
has read about subs and their record in World War II;

Additional Evidence: _____

_____

_____

5. Aptitude for Submarines

Definite Reject	Conditional Pass	Definite Pass	Outstanding Prospect
☐	☐	☐	☐

Factors from Record

- ☐ Low GCT;
- ☐ low mechnical aptitude;
- ☐ poor grade school and high school record;
- ☐ high GCT; generally high level scores;
- ☐ grade school and high school record high;

Psychological Factors

- ☐ has poor grasp of mechnical principles;
- ☐ disliked study in school;
- ☐ "gadgeteer";
- ☐ good grasp of mechanics, has studied on his own;
- ☐ acquired general knowledge of principles of buoyancy;

Additional Evidence: _____

_____

_____

6. Overall Judgment

- ☐ Recommend unqualifiedly
- ☐ Recommend
- ☐ Recommend with reservations
- ☐ Reject

Remarks: _____

_____

_____

_____
(Doctor's signature)

APPENDIX C

First Revision of Interview Report Form Instituted During the Present Investigation

INTERVIEW FORM

(FORM 2)

Interviewee: _____ Serial: _____

Interviewer: _____ Date: _____

Directions: -- You are asked to rate the man on each of five traits and also on your overall judgment. So that words may mean the same thing to different examiners, example of unfavorable and favorable evidence have been listed under each trait. These lists are suggestive not definitive. The number of boxes checked under a particular heading does not add up to a score. A man may be rated "Outstanding" with relatively few items checked. Another man may be "Poor" with the same number of check marks. You are asked to check the evidence you observe and to add any observed evidence not listed. Complete the form during or immediately after the interview.

SUMMARY

	Outstanding	Good	Adequate	Poor
Personal Adjustment	☐	☐	☐	☐
Adjustment to Navy Life	☐	☐	☐	☐
Motivation	☐	☐	☐	☐
Interest in Submarines	☐	☐	☐	☐
Aptitude for Submarines	☐	☐	☐	☐

OVERALL JUDGMENT:

- ☐ Recommend unqualifiedly
- ☐ Recommend
- ☐ Recommend with reservation
- ☐ Not recommended

NMRL Rev. 12-51

Unfavorable

Favorable

1. PERSONAL ADJUSTMENT

Physical Factors:

- ☐ excessive sweating
- ☐ tremors
- ☐ nail biting
- ☐ marked evasiveness of manner
- ☐ underdeveloped
- ☐ effeminate build
- ☐ too neat
- ☐ sloppy
- ☐ poor posture
- ☐ hypertension
- ☐ acne
- ☐ tense and blocked

- ☐ somewhat sloppy
- ☐ fair posture

- ☐ normal tonus
- ☐ good posture, physique and carriage
- ☐ normal equilibratory response
- ☐ clean and well groomed
- ☐ skin in good condition
- ☐ good overall impression

Additional Evidence: _____

Psychiatric Factors:

- ☐ immature outlook
- ☐ goals unrealistic
- ☐ fails to face reality
- ☐ emotions of child
- ☐ undue anxiety over future
- ☐ disorganized personality
- ☐ lacks confidence in sex role
- ☐ extremely shy

- ☐ poverty in childhood

- ☐ mature perspective goals realistic
- ☐ controlled emotional responses
- ☐ cohesive organized personality
- ☐ assurance in sex role

Additional Evidence: _____

Psychological and Sociological Factors:

- ☐ gross family instability
- ☐ broken home
- ☐ "wife trouble"
- ☐ marked sibling rivalry
- ☐ history of psychiatric complaints in family
- ☐ over-dependence on family
- ☐ parental hostility

- ☐ unable to get a full story

- ☐ normal home and home life
- ☐ relatively independent of parents
- ☐ health history of family normal
- ☐ adapted well to undesirable family situation

Additional Evidence: _____

Outstanding	Good	Adequate	Poor
☐	☐	☐	☐

2. ADJUSTMENT TO NAVY LIFE

Factors from Man's Record:

- ☐ record of recurrent offenses
- ☐ has sought many changes of rate and station
- ☐ denies disciplinary problem
- ☐ insufficient service to evaluate
- ☐ occasional minor offenses
- ☐ clean record
- ☐ meritorious mast; few changes in plans of rate and station
- ☐ advancements in rate

Additional Evidence: _____

Psychological Factors:

- ☐ rebels against authority
- ☐ carried chip on shoulder against Navy
- ☐ no concern about own advancement
- ☐ "non-reg" in appearance and manner
- ☐ over-resentment at recall to duty
- ☐ financial hardship at recall
- ☐ suspected hostility
- ☐ accepts authority
- ☐ military bearing and manner
- ☐ wants to make Navy his career
- ☐ concern about advancement

Additional Evidence: _____

Social Factors:

- ☐ "lone wolf" on job and on liberty
- ☐ not accepted by shipmates
- ☐ does not make friends easily
- ☐ extreme extroversion
- ☐ preoccupied with his personality defects
- ☐ no sport or group activity
- ☐ "team player"
- ☐ popular with shipmates
- ☐ likes group function
- ☐ meets new people easily
- ☐ not too extroverted
- ☐ easy to talk to

Additional Evidence: _____

Outstanding	Good	Adequate	Poor
☐	☐	☐	☐

Unfavorable

Favorable

3. MOTIVATION

Psychological Factors:

- ☐ "grasshopper pattern"
- ☐ fails to follow through on task completion
- ☐ energy level low - lethargic
- ☐ does just enough to get by
- ☐ no evident value pattern
- ☐ fails to work up to level aptitudes
- ☐ low motivation for USN
- ☐ unable to determine
- ☐ undecided about Navy
- ☐ "stick-to-it-iveness
- ☐ high level of energy well directionalized
- ☐ stable and acceptable value pattern
- ☐ accomplishes more than aptitude level warrants

Additional Evidence: _____

_____

_____

Sociological Factors:

- ☐ fails to share group goals
- ☐ selfish
- ☐ negativistic
- ☐ adjusts well in group operation
- ☐ able to subserve personal goals

Additional Evidence: _____

_____

_____

Outstanding	Good	Adequate	Poor
☐	☐	☐	☐

4. INTEREST IN SUBMARINES

- ☐ impulsive decision to "sign up"
- ☐ romantic notion of life on board
- ☐ put in for subs to avoid difficult adjustment elsewhere
- ☐ never been on board
- ☐ poorly oriented
- ☐ unable to give reasons for applying
- ☐ motivated principally by personal advantages
- ☐ vague ideas
- ☐ may abandon if desired
- ☐ realistic picture of submarines based upon visiting on board
- ☐ friends or relatives in subs
- ☐ has read about subs and their record in WWII
- ☐ been to sea

Additional Evidence: _____

_____

_____

Outstanding	Good	Adequate	Poor
☐	☐	☐	☐

Unfavorable Favorable

5. APTITUDE FOR SUBMARINES:

Factors from Record:

- ☐ low GCT
- ☐ low mechanical aptitude
- ☐ poor grade school and high school record
- ☐ poor school record with high GCT
- ☐ high GCT; generally high level test scores
- ☐ grade school and high school record high
- ☐ excellent school and work record with low GCT
- ☐ excellent school and work record; low GCT

Psychological Factors:

- ☐ has poor grasp of mechanical principles
- ☐ disliked study in school
- ☐ fair grasp of mechanics
- ☐ "gadgeteer"
- ☐ good grasp of mechanics has studied on own
- ☐ acquired general knowledge of principles of buoyancy
- ☐ good overall knowledge submarines
- ☐ interest in related sciences

Additional Evidence: _____

_____

_____

Outstanding ☐ Good ☐ Adequate ☐ Poor ☐

. . . . . .

6. SERVICE SCHOOL RECORD:

(Type of School _____)

- ☐ Upper one-fourth
- ☐ Middle one-half
- ☐ Lower one-fourth
- ☐ History of having failed

Remarks: _____

_____

_____

7. OVERALL JUDGMENT

- ☐ Recommend unqualifiedly
- ☐ Recommend
- ☐ Recommend with reservations
- ☐ Not recommended

Remarks: _____

_____

_____

8. SUB. SCHOOL PREDICTION:

- ☐ Upper quarter
- ☐ Middle half
- ☐ Lower Quarter

_____
(Doctor's signature)

APPENDIX D

Table 1.- THE RELATIVE DEGREE OF CONSISTENCE IN THE COVERAGE OF EXISTENT SUBJECT MATTER THROUGHOUT 109 INTERVIEWS WITH CANDIDATES FOR THE SUBMARINE SERVICE DURING THE PERIOD 15 MARCH 1951 TO 15 JULY 1951, AND THROUGHOUT THE INTERVIEWS OF EACH INTERVIEWER.

Section 1. Family Background
Section 2. Personal Background
Section 3. Educational Background
Section 4. Work Experience
Section 5. Navy - Submarine Service
Section 6. Physical Condition

Table 1.- The relative degree of consistency in the coverage of existent subject matter throughout 109 interviews with candidates for the submarine service during the period 15 March 1951 to 15 July 1951, and throughout the interviews of each interviewer.

SECTION :

FAMILY BACKGROUND	Total N=109	A N=43	B N=21	C N=20	D N=15	E N-5	F N=5
Parents - Living, deceased, separated	70	60	76	85	87	20	60
Health	15		5	55	20	40	
Residence of Parents	8	9	14	5	7		
Mobility	1		5				
Home Pre-service	15	16	38			20	
Home atmosphere	7	12	5	5	7		
Rearing methods	5	5			7	40	
Visit during service	5	5	10				20
Home correspondence	5	9			7		
Closest parent sided with	2	2	5				
Mother's occupation	6	2	5		7		
Personality of Mother	5						
Attitude toward Mother	4	5					
Mothers Attitude toward sub service	50	65	33	35	47	60	40
Relationship with Mother	1	7	5	10	20	20	
Father's occupation	43	39	62	55	7	40	60
Personality of Father	1			5			
Attitude toward Father	5	2	10	5		20	
Father's attitude toward sub service	37	49	24	20	40	40	40
Relationship with Father	16	12	33	15		40	
Father's income	2	2		5			
Siblings - number	81	72	90	80	100	80	60
Relative position in family	54	37	67	55	87	60	40

APPENDIX D

Table 1. - The relative degree of consistency in the coverage of existent subject matter throughout 109 interviews with candidates for the submarine service during the period 15 March 1951 to 15 July 1951, and throughout the interviews of each interviewer.

SECTION 2:

PERSONAL BACKGROUND	Total N=109	A N=43	B N=21	C N=20	D N=15	E N=5	F N=5
Age	6		5	15		40	20
Nationality	4	5		10			
Religion	7				20	20	80
Religious observance	7				20	20	80
Birthplace	9	19	10				
Hometown	34	32	33	45	20	80	
Kind of place	9	7	14	5	7	40	
Time in residence	7	14	5			20	
Civilian difficulties	6	9	5	10			
Marital status	75	56	95	95	93	100	
Age at first intercourse	2	2	5				
Homosexual experience	2	5					
Attitude toward homosexuals	2	5					
Political membership							
Other organizational membership	7			25	7	20	
Earliest recollection	1				7		
Excitement activity	6	16					
Travel experience	4	7	5				
What wants out of life	1		5				
Behaviour when angry	2		5	5			
Bad habits	6		10	5		80	
People upset him most	9	5	10	20		40	
Three most treasured possessions	1					20	
Outstanding accomplishments	5		10	5		40	
Owns a car	10	12	14	5	7	20	
Ridden a motorcycle	3	5				20	
Hot rods	1	2					
Habits of saving money	6	2	14	5	7		
People most admires	1			5			

APPENDIX D

Table 1.- The relative degree of consistency in the coverage of existent subject matter throughout 109 interviews with candidates for the submarine service during the period 15 March 1951 to 15 July 1951, and throughout the interviews of each interviewer.

SECTION 3: EDUCATIONAL BACKGROUND	Total N-109	A N-43	B N-21	C N-20	D N-15	E N-5	F N-5
High School-College	86	84	95	95	67	100	80
Age at leaving	10	9	19	5		20	20
Reason for leaving	64	60	67	60	47	100	80
Major interest	31	49	19	25		40	40
Reason for interest	16	21	10	20		20	20
Favorite subjects	17	7	5	10	73	20	20
Failed subjects	8	7	5	25			
Academic standing	25	14	29	50	20	40	
Work through school	31	42	24	30	27	20	
Extra-curricular activities	13	2	10	25	20	20	
Athletic activities	41	37	14	50	60	80	60
SECTION 4: WORK EXPERIENCE							
Position (s)	56	63	43	50	40	100	80
Company-place	43	37	43	40	40	100	60
Length of time in job(s)	38	51	29	25	13	60	40
Interest in job(s)	12	14	14	5	7	20	20
Income from job(s)	6	7	[illegible]	10	7		20
Family dependence	3		10-	5			
Reason for leaving	10	16		5	13		20

APPENDIX D

Table 1.- The relative degree of consistency in the coverage of existent subject matter throughout 109 interviews with candidates for the submarine service during the period 15 March 1951 to 15 July 1951, and throughout the interviews of each interviewer.

SECTION 5:

NAVY SUBMARINE SERVICE	Total N-109	A N-43	B N-21	C N-20	D N-15	E N-5	F N-5
Reason for entry into Navy	43	49	38	35	20	80	80
Length of service	50	60	38	40	33	100	60
Kind(s) of duty	55	77	38	50	40	60	40
Place(s) of duty	50	77	57	25	13	40	20
Adjustment-discipline	36	58	38	25	7		
Leisure-time activities	35	21	48	35	60	60	
Test performance	20	9	43	30	7	20	20
Rating	23	14	29	35	20	40	20
Future plans after Navy	34	53	5	40		60	40
Submarine-reason for interest	83	88	76	80	87	100	60
Time of interest	34	49	5	20	47	40	40
Contact with submarine people	41	74	24	20	13		40
Information about submarines	15	28		15			20
Contact aboard submarines	46	63	14	25	73	60	20
Qualities of a submariner	5			5		80	
Qualities can offer submarines	4					80	
Certainty of desire for submarine service	16	30	5		7	20	20
Desired position on submarine	42	37	50	33	53	60	40
Capable of making submarines	3			10		20	
Nature of submarine life	14	14	10	10	7	40	40
Technical knowledge of subs	24	14	20	10			20
Interest in related sciences	17	16	10	10	7	100	20

APPENDIX D

Table 1.- The relative degree of consistency in the coverage of existent subject matter throughout 109 interviews with candidates for the submarine service during the period 15 March 1951 to 15 July 1951, and throughout the interviews of each interviewer.

SECTION 6:

PHYSICAL CONDITION	Total N-109	A N-43	B N-21	C N-20	D N-15	E N-5	F N-5
General health	17	22	14	15		40	
Complaints	12	12	10	20		20	20
Illnesses	10	5	19	25			
Operations	1	2					
Allergies	1		5				
Accidents	4	5	5	5			
Communicable diseases	8	5	10	25			
Headaches	5	12	14				
Nervous condition	23	19	14	15	13	40	20
Drinking habits	6			15		20	40
Smoking habits	3			5		20	20
Dental condition	4		10	10			
Habits of cleanliness	1					20	
Phobias	1						20